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UNIVERSITY OF CALIFORNIA

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CROCKER LABORATORY
BERKELEY 4, CALIFORNIA

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February 25, 1953

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Dr. John C. Bugher
Director, Division of Biology and Medicine
U. S. Atomic Energy Commission
Washington 25, D. C.

Dear John:

In my opinion it would be desirable to include on the agenda for the Tri-Partite Conference on Permissible Doses a discussion of the problems surrounding the inhalation of radioactive particles. How far this can be extended from the security point of view I am not in a position to judge. However, as you probably know, the Chemical Corps is planning to detonate munitions at the 100,000 curie level at the proving grounds at Dugway. Also there is, of course, the program at the Nevada test site. In addition to these two areas there is the release of active particulate matter from production plants and some of the laboratories sponsored by the Commission.

Here at Berkeley some of our studies of plutonium in rats has indicated that there appears to be migration to the hilar lymph nodes of particles which are insoluble in character containing plutonium. This information is in agreement with what is known to take place in anthracosis in man as well as experimental studies that have been done in other laboratories. Attention might be directed towards two phases of this problem. The first is the question of dosimetry for both alpha-particles and beta-particles. The second is the potential carcinogenesis that may arise from the inhalation and retention of such particles.

Doctor Burnett at the Oak Ridge National Laboratory has reviewed certain phases of this problem in an unclassified report, O.R.N.L. Central File Number 52-11-1. His paper and the comments by Doctor T. F. Hatch of the University of Pittsburgh are in a preliminary form. The statement is made that there is no firm evidence for or against of the presence of hazards due to the inhalation of radioactive particles. This is a reasonable statement, however, a relatively short period of time has elapsed between when a significant number of individuals were exposed to insoluble radioactive particles and the present. The history of the radium dial painters indicates that there was a considerable time interval between exposure to soluble compounds of radium and the appearance of osteogenic carcinoma. This time delay would appear to be of the order of from 10 to 20 years and

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apparently a similar situation exists with radiologists with respect to leukemia and malignancies of the skin.

Doctor Morgan was one of the first people to become cognizant of the particle hazard and I feel that his advice with respect to this problem will be invaluable. Another suggestion that I would like to offer is that possibly one of the people from the Chemical Corps with a "Q" clearance, could be asked to be present at this particular phase of the discussion. They have had considerable experience with aerosols for many years and it might be that this could be put to good use in discussing the overall problem.

Another area of interest would appear to be an attempt to evaluate further the relative biological effectiveness of alpha-particles as compared to beta-particles and gamma-rays. There is a good deal of contradictory information in the literature on this subject. The use of an arbitrary value of 20 should be examined quite carefully for if it appears that this number is too high some operations that are of interest to the Commission would be considerably simplified.

With best regards.

Sincerely yours,

Joseph G. Hamilton, M.D.

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Copy 1 - Dr. Bugher ✓
Copy 2 - File (Dr. Hamilton)

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